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ABSTRACT

This activity is one of a series of 17 teacher-developed instructional activities for geography at the secondary grade level described in SO 009 140. This activity investigates the proposed construction of a dam. It employs a simulation technique in which students debate the conflicts that may evolve between groups with differing goals. To provide background information and to set the scene for the simulation, two short newspaper articles discuss crop yield increase due to irrigation and land value increases. A letter to the editor and an article opposing the building of the dam are also included. Eleven roles are presented for various special and nonspecial interest group members of the community who will be affected favorably or adversely by the building of the dam. These include farmers, representatives from a coal burning electric plant and land speculators, and a fisherman. Each role discusses the position of one person toward building a dam and offers reasons for holding those positions. The issues are debated among the various interest groups and culminate in a special hearing. An environmental impact statement and a fact sheet, describing such things as the cost and advantages of the dam, are presented. A map shows dam construction. (Author/DB)

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National Council for Geographic Education

INSTRUCTIONAL ACTIVITIES SERIES 1A/S-

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WHAT IS ALL THIS DAM FOOLI HNESS?

by

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U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE NATIONAL INSTITUTE OF EDUCATION

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This is a simulation centered around the proposed construction of a dam. The student is introduced to conflicts that may evolve between groups with differing goals. The issues will be debated between the various interest groups and culminate in a special hearing.

In the operation of this simulation, certain background information is necessary. Some follows in the form of newspaper articles, roles, research reports, and maps. Additional information will be supplied when necessary during the activity.

The following articles are from the Boonesville Banner, a local paper

IRRIGATION DOES PAY

The irrigated acreage of field corn is increasing and will probably continue to do so, but at a slow rate. Data from Iowa, Indiana, South Carolina, Georgia, etc. reveal that irrigation of field corn can be economically feasible, but the margin of profit is small. Also, irrigation must be combined with other good production practices such as adequate fertilization and high plant population levels. If irrigation equipment is purchased just to irrigate corn, the returns will be small, however, if the fixed costs can be spread to other crops, corn irrigation becomes more attractive.

SO 009 151

CROP YIELD INCREASE DUE TO IRRIGATION IN POLK COUNTY, NEBRASKA, 1968.

	Non-Irrigated	Irrigated	Increase
Field Corn (Yield by/acre shelled corn)	45	120	75
Alfalfa Hay (Yield tons per acre dry matter)	2	4.5	2.5
Soybeans	15.6	38.9	23.3

AMERICA'S LAND BOOM

Land is a prime buy. Year after year surveys of growth items spotlight the rise in value of a small group of steady owners: old paintings, rare books and manuscripts, and antique furnishings. Invariably, however, such surveys end by pointing out that land prices equal or top the rise in all other speculative investments.

The simplest and most obvious reason for this is that the quantity of land is fixed while the population grows and grows. Using current population projections, it appears likely that during the twentieth century the number of people in the United States occupying the same numbers of square miles will have tripled.

DEAR SIR:

As spokesman for the Arby County Highway Commission, I and my fellow associates are incensed at the proposal to construct a dam on the Rapid River. The state, after much debate, has allocated $65 million dollars to build this road.

To build the road across the dam would cost an additional $25 million dollars. The possibility of the state appropriating any extra funds is extremely unlikely.

Highway 65 is of extreme importance to the citizens of Arby County because it is needed to handle increasing traffic congestion. Farmers need this road to haul their grain. New industry will consider relocating here because it will be easier to bring in the raw materials they need and to ship out the finished product.

The citizens of Arby County need this road. Please do not deprive them of it.

D. Sturm

WORK SLOWDOWN THREATENED

In an exclusive interview yesterday with Mr. Paul White, manager of the Arby Coal-Burning Electrical Power Company, it was learned that the employees of the power plant are threatening a work slowdown if the dam is built. If their threat is carried out, there will be a serious curtailment of electrical power in Arby County, which will affect homes and businesses alike.

Mr. White also pointed out that, if the dam is built, his company will be unable to compete with the cheaper hydroelectric power that will be generated by the Arby Power Company. As a result he will have to lay off fifty workers, thus adding to the serious unemployment problem in Arby County.

LIST OF ROLES

Otto Schulz, Farmer

You are in favor of the proposed dam. In recent years the market price for most farm products and livestock has declined, necessitating that farmers consolidate holdings, increasing the acreage under cultivation, and adding to herd size. The big farm can become more efficient because of the scale of its operation.

You see the construction of the Arby Dam as your chance of increasing your land holding for grazing and increasing the size of your herd of cattle. The dam would give you a cheap source of water to support your herd, besides the water needed to irrigate the grazing land. You also have a good percentage of your land in spring wheat.

Therefore, you will join the coalition seeking the construction of Arby Dam.

Philip Scully, State Highway Spokesman

You represent the State Highway Department interests. As spokesman for this group you are very much opposed to the building of the dam for you were intending to put a new highway across the same area where the reservoir will be located.

The State Department of Public Works has allocated just enough money to build the road and there is not enough money provided in the budget to detour around the reservoir.

You are also concerned that if the proponents of the dam get their way this time, it might start a precedent in the state and hamper other road building programs.

A third reason why you are against the dam being built is a personal one. For many years you have been an avid fisherman, and have spent many happy hours on the banks of the Rapid River. In the last year or two you have read numerous articles about dams destroying fish of various types. You are quite concerned about what might happen to fishing on the Rapid River if the dam is constructed.

Richard Miles, Member of the Northern Council of Anglers Unlimited

You are a retired biologist residing in Arby County because of its excellent fishing. Since retirement you spend most of your leisure time fishing. In fact, you organized and are now president of the Northern Council of Anglers Unlimited, an organization promoting the sport of fishing.

You worry about what the dam will do to the fish in the Rapid River. You realize that there could be danger of nitrogen supersaturation to Rapid River fish if the dam is constructed. You are organizing a campaign around this issue. You are positive that there will be no decent fishing in five years if the dam is built.

Raymond Jonson, Farmer

You live south of the proposed Arby Dam with your small family. You have experienced some economic difficulties in recent years.

Most of your half section is planted in hybrid corn, which demands large quantities of water, with the heaviest demand during the early growing period.

However, Arby County usually is deficient in rainfall. Many of your neighbors have had to abandon their lands because the level of underground water was so low that the cost of pumping water for land irrigation became ruinous. Cheap and abundant irrigation water, generated at a multiple-purpose dam, would greatly cut costs and increase crop yields.

You have decided to attend the public hearing concerning the construction of Arby Dam.

Paul White, Manager of the Coal Burning Electric Plant

You are 39 years old, married, the father of three children and live on the outskirts of Boomsville. You represent the coal burning electrical plant which is currently supplying Boomsville with its electrical power. The coal burning hierarchy realizes that if the dam is constructed, they will be put out of business because their rates will be higher than the Arby Power Authority. Needless to say, they are very much against the construction of the dam.

You point out that it will be at least thirty years before the coal burning electrical plant will reach its full capacity. In addition, you state that the capacity of the plant could be increased by that time.

You also point out that if the dam is built the property owners will be paying higher property taxes than they are now paying because the Federal Government is only paying 80 per cent of the cost. The small savings that will result from cheaper electrical power will not effect their higher property taxes, he believes.

The nature of your role allies you with Mr. Scully of the Highway Department.

Robert Milton, President of the Taxpayers League of Boomsville

The league is made up of concerned citizens from all walks of life in the community. Basically, your group has two major objectives. The first, and perhaps the most important, is that of distributing information regarding the tax structure of Boomsville and informing the citizens of the affect additional taxes would have on them. The second objective promoted by the league is to act as a "watchdog" over the funds incorporated in the city's ever increasing budget. In other words, the league is concerned that there is no waste of city monies.

In the past your organization has been far from negative regarding tax increases if you feel the funds are justified. Your group has come out against the construction of the dam on the Rapid River. As spokesman for the BTL you will argue that this project will place too big a burden on the taxpayers. You feel that this tax increase might force the citizens of Boomsville to withdraw their support from more necessary projects, such as, street and road repair after a hard winter, additions to the public library and a new municipal swimming pool that can be foreseen in the very near future. The proposed new assessment might well lead to a "taxpayers revolt" so prevalent in other areas of the State, but thus far avoided by the city of Boomsville.

Fred Land, Land Speculator

You have been involved in the buying and selling of land for a profit and are strongly in favor of building the dam because of confidence in land value increases due to the recreational possibilities of the dam and reservoir.

At the present time you own a 200 acre tract that lies very close to where the reservoir will be if the dam is built, which you purchased a number of years ago at $100 an acre. At the present time you estimate the value of the land at about $200 an acre and calculate the value of the land will increase to approximately $1500 an acre if the dam is built.

You also own other smaller scattered lots in the city of Boomsville and feel sure that this land will also increase in value as new industry and people are attracted to Boomsville.

William Lawton, Member of the Hearing Board, Representative of the City of Boomsville

You have been selected by the mayor to serve on the hearing board to represent the interests of Boomsville regarding the building of the proposed dam on the Rapid River. You are a retired department store executive and a respected member of the community having served on several boards and commissions.

Your children and grandchildren live in Boomsville and you are interested in the city's continued growth. Although you have positive feelings about the proposed dam, your past experience of serving on various community committees has taught you to keep an open mind regarding any proposal that affects the entire community.

You will listen to the evidence closely, ask questions of the various group presentors, analyze the recorded testimony and cast your vote regarding the construction of the dam with the view that seems most beneficial for the city and its citizens as a whole.

Dr. Leonard Wilson, President of the State University, Hearing Board Chairman

You have been asked to serve as chairman of a joint city-county committee as a neutral party. Your task will be to conduct the hearing on the proposed dam project on the Rapid River. You must evaluate all the evidence presented, make sure that all parties have a chance to speak their views, keep order during the proceedings and, on the basis of the evidence, come to a decision regarding the building of the dam.

You are honored to have been asked to serve in this capacity but you are also aware that your vote will affect the lives of many citizens in this part of the state. You must be able to understand all the presentations and be able to clarify and summarize the points made by the various groups in their presentations.

Ted Wise, Member of the Hearing Board, Representative of the County Board of Commissioners

You are currently a member of the county board of commissioners. Your fellow board members have selected you to represent the county interest on the hearing board. You have lived in the county all of your life. Although your father was a farmer, you have not taken up farming as an occupation, choosing instead to follow a career in law. Your practice is state-wide although your permanent home is in a rural town some five miles southeast of Boomsville. Your brother has taken over the family farm so you still have an interest in farm matters. You have served on the county board for ten years and have two years to run on your present term.

Your fellow board members selected you to represent the county because of your insight into rural problems, your familiarity with legal matters such as property claims and land values, and your ability to weigh both sides of a proposal with the end result being a vote for what is best for all concerned.

You will listen to the evidence closely, ask questions of the various group presentors, analyze the various arguments and data, and cast your vote regarding the construction of the dam on the Rapid River.

William Roberts, Representative of the Army Corps of Engineers

You are the spokesman for the Army Corps of Engineers. You have worked for the Corps of Engineers for ten years. During this period the Corps has received both praise and criticism for the projects in which they have been engaged. Since early in our country's history, the Corps of Engineers have worked to improve harbors and waterways, built dams and canals, and taken part in nationwide flood control projects.

During the last decade the issue of ecology has become of major concern in your department. In an effort to overcome conflicts in this area, the Corps of Engineers has endeavored to get the citizens more involved in the planning required in their projects.

Your organization has just completed a two year study that was requested by a group of concerned citizens on the feasibility of constructing a dam on the Rapid River. Your role will involve presenting to the citizens of Arby County some of the important facts that your study has revealed. You must also present the citizens with an environmental impact statement regarding the proposed dam. This statement should mention any adverse environmental effects which cannot be avoided should the project be implemented, alternatives to the proposed action, the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity and any irreversible and irretrievable commitments of resources which would be involved in the proposed construction of the dam. You will be provided with a fact sheet on the proposed dam and an environmental impact statement to help you fulfill your role. You should study this information in order to be prepared to answer questions of local citizens and also make a presentation to the hearing board. Information pertaining to the environment can be presented to the press during the course of the game or through meetings with various citizen groups before your formal presentation before the hearing board. The information you have gathered will have an important bearing on the feelings of the citizens regarding the issue of constructing the dam on the Rapid River.

FACT SHEET ARBY DAM PROJECT STUDY

William Roberts: Chief Engineer, Representative Army Corps of Engineers.
Type of Dam: Arch Gravity Dam with Earth Fill Embankments.
Cost: Estimated total cost twenty million dollars.
Cost assumed by the Federal Government, sixteen million dollars.
Cost assumed by the citizens of Arby County, four million dollars.
Time for Construction: Estimated time for completion is four years pending approval of funds by Congress.
What the Dam will Provide: The Arby Dam will be a multiple purpose facility. It will provide industrial water, hydroelectric power, a means for flood control, irrigation water and recreation areas.*
Number of Workers Needed: Estimated number of workers needed at peak period of construction is fifteen hundred. Sixty percent of the above mentioned labor force to come from local area, about nine hundred people.

* Types of Recreational Facilities Proposed:
Swimming areas
Picnic and Hiking Areas
Fishing
Boat launching ramps
Camping areas for tents and trailers

ENVIRONMENTAL IMPACT STATEMENT

The project study has made simple surveys of the rock structure and have found them capable of supporting the proposed dam.

In locating the reservoir, consideration has been given to creating the reservoir with the smallest area of evaporating surface possible for the storage capacity.

Consideration has also been given to the problem of possible faulting and fractured foundation rock, as well as porous rock out-crops that would lead to leaking. The Corps feels this factor will not be a problem in the Arby Project.

It should be mentioned that much of the materials needed for the construction of the proposed dam are close at hand in areas in or near Arby County. This will minimize the cost of importing materials long distances. It will also lower the amount of damage to roads that can occur by movements of heavy machinery and loaded truck traffic over them.

The Corps has attempted to avoid the situation of excessive flooding of land valuable for other purposes than water regulation where ever possible.

It is noted that the proposed reservoir will of necessity flood out a wildlife preserve. This important area will be relocated at a new location adjoining the reservoir. This procedure has been followed in other projects with great success and the plans for relocating this wildlife preserve should be achieved with a minimum of difficulty and cost.

The proposed Arby Dam will have three sluices or passages for water with a valve for stopping or regulating the flow of water. Two of these passages will allow fish to pass through without any harm.

To further protect the fish, a control will be added that will make it possible to regulate water temperatures in the hot summer periods when the water in the river becomes overly warm. In the past this has led to large fish kills. The control on the dam will make it possible to pump in cooler water during these hot periods thus improving the habitat of this species of wild life and enhance the recreational prospects of local sports fishermen.

Upon completion, the Arby Dam will have a life expectancy of 75 years. The problem of inflowing sediment, which naturally reduces reservoir storage capacity, should not become a serious problem for a number of decades. It is further anticipated that when the problem of sediment removal becomes necessary, new and less expensive methods will have been devised than those currently in use.

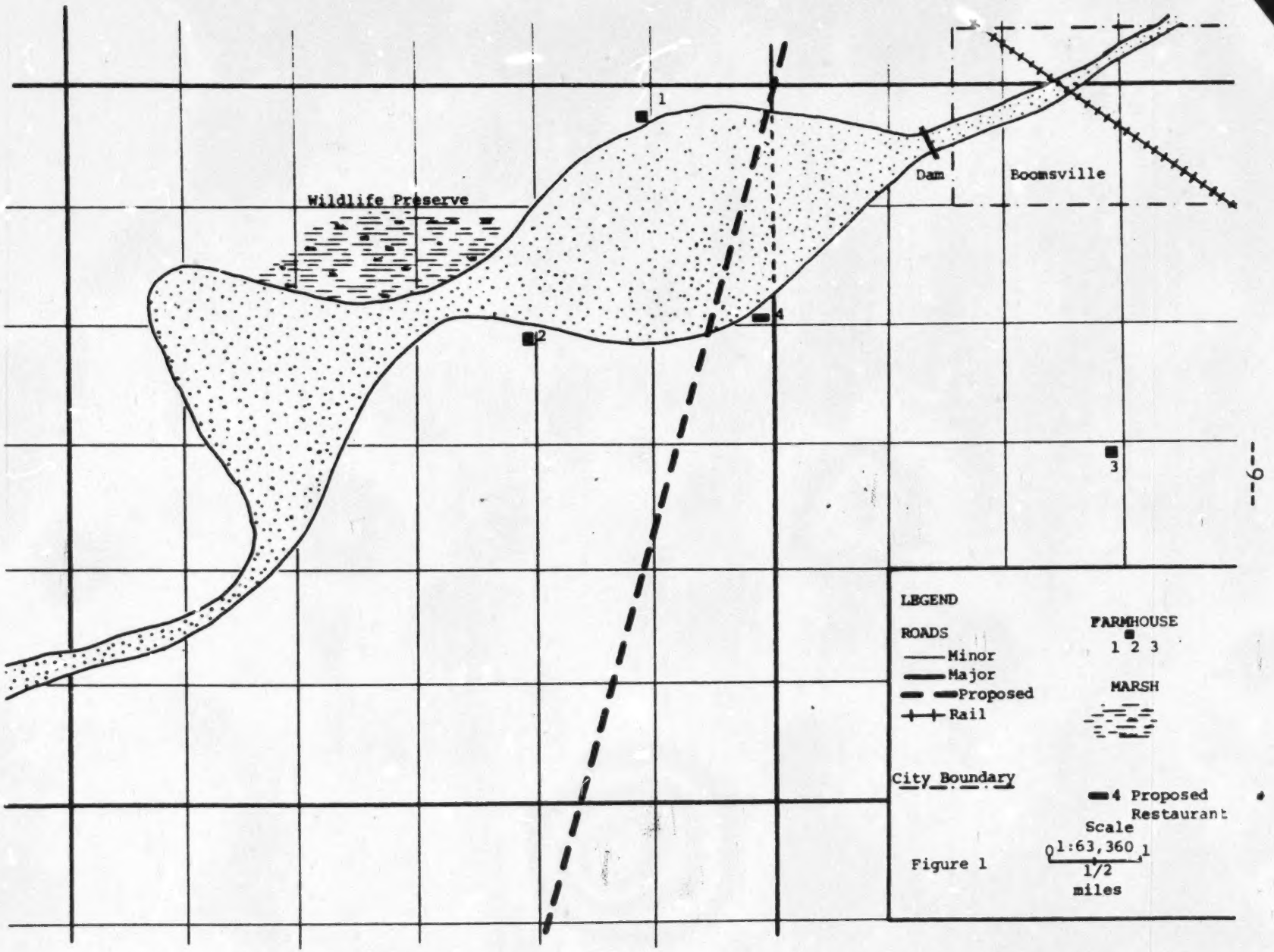
Wildlife Preserve
Dam
Boomsville
1
2
3
4
LEGEND
ROADS
Minor
Major
Proposed
Rail
FARMHOUSE
1 2 3
MARSH
City Boundary
4 Proposed Restaurant
Scale
1:63,360
0 1
1/2
miles

Figure 1